Omaha Riverfront Revitalization

OWNER
City of Omaha

CLIENT
MECA

DESIGN TEAM
HDR & OJB

GEOTECHNICAL ENGINEER
HDR

CONSTRUCTION MANAGER
Kiewit

DRILLING, LABORATORY, INSTRUMENTATION, & SPECIAL INSPECTIONS
Terracon

QUALITY CONTROL
Thiele Geotech & Team Services

1973

Site Features:

- Buildings
- Recycled Battery Smelting Plant
- Warehouses
- Lead Smelting Plant
- Union Pacific and BNSF Railroads
- Interstate 480
- Above-Grade High-Voltage Transmission Line
- Storm Drainage Outfalls
- Sanitary Forcemain
- Flood Wall
- Missouri River

2017

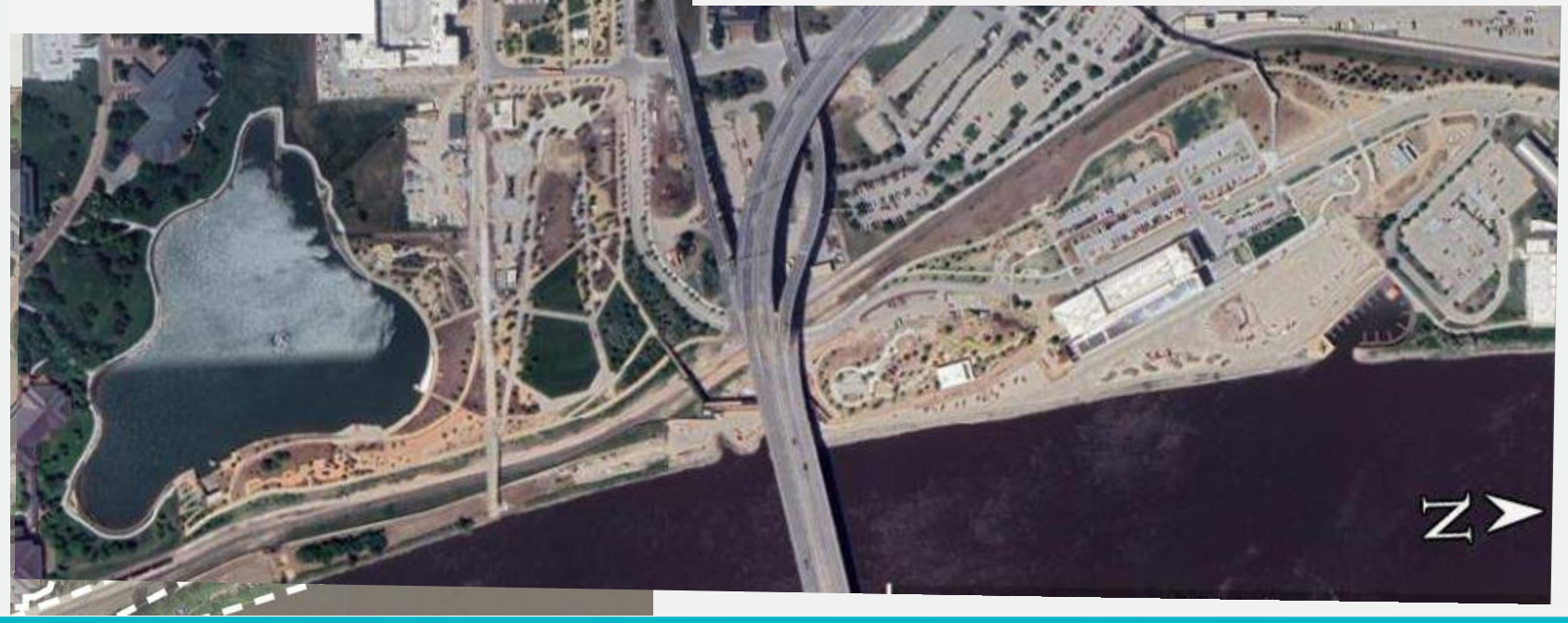
Site Features:

- Historical Buildings
- Excavated Lagoon and Lake
- Buried Lead Contaminated Waste and Geosynthetic Clay Liner
- Retaining Wall
- Union Pacific and BNSF Railroads
- Interstate 480
- Buried High-Voltage Transmission Line
- Storm Drainage Outfalls
- Sanitary Forcemain
- Flood Wall
- Missouri River

2017 to 2023

Geotechnical Challenges:

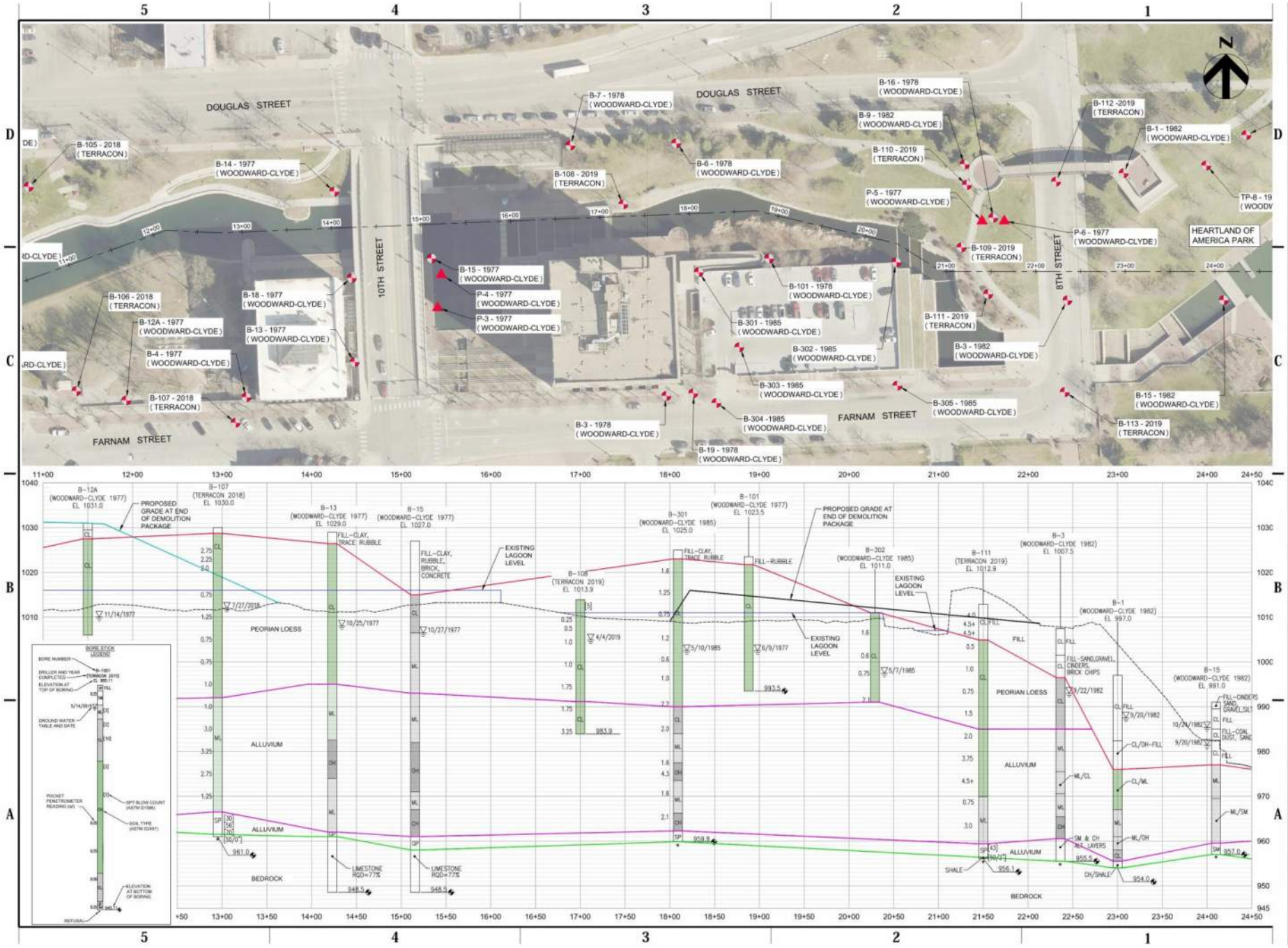
1. Demolition Adjacent to Historical Buildings
2. Building Foundations over Buried Lead Contaminated Waste and Geosynthetic Clay Liner
3. 40-FT Fill adjacent to Retaining Wall, Buried High-Voltage Transmission Line, and Storm Drainage Outfall
4. Fill adjacent to Omaha Flood Wall
5. Bridge Foundation adjacent to Flood Wall and Sanitary Forcemain



#1 Demolition Adjacent to Historical Buildings

Solution:

- Foundation Evaluation
- Structural Condition Assessment
  - Photograph and LiDAR survey
- Equipment Limitations
  - 0-30 feet only light equipment
  - 30-40 feet hydraulic hammer
  - 40+ feet no limitations
- Structural Engineer On-Site during Demolition
- Real-Time monitoring with Seismographs
  - Vibration Threshold
    - 0.2 in/s for Frequency <30Hz



GENE LEAHY MALL EAST

Owner
Downtown Riverfront Trust, LLC
3555 Farnam Street
Omaha, NE 68131

Landscape Architect + Prime Consultant
QJB LANDSCAPE ARCHITECTURE
550 Lomas Santa Fe, Ste A
Solana Beach, CA 92075

Site Civil
HDR Engineering, Inc.
1917 S. 67th Street
Omaha, NE 68106

LEGEND

- BORE LOCATIONS
- PIEZOMETER LOCATIONS
- APPARENT BOTTOM OF FILL
- APPARENT GEOLOGIC BOUNDARY
- APPARENT SURFACE OF BEDROCK
- PROPOSED FINISHED GRADE
- PROPOSED GRADE AT END OF DEMOLITION

Key Plan

REV	DATE	DESCRIPTION
	04/15/2019	

PROJECT NO. OPW 53503

Drawing Title

SUBSURFACE PROFILE

Drawing Number

FIG-05

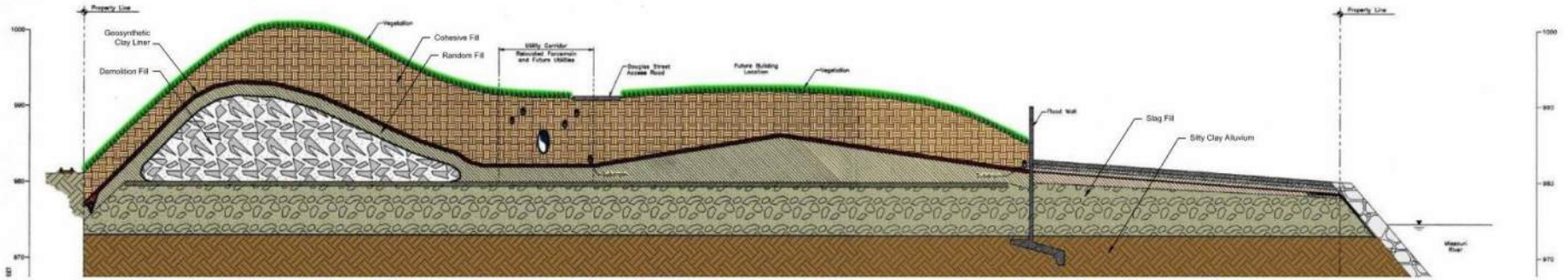

CAT
Flush Cut
Flush Cut


BRICKLANE

#2 Building Foundations over Buried Lead Contaminated Waste and Geosynthetic Clay Liner

Solution:

- Review Historical Aerial Photograph
- Review Old Plan Sets
- Geophysical Investigation
  - Multi-Channel Analysis of Surface Waves (MASW)
- Micropiles Socketed into Bedrock
  - Can drill through obstructions
  - Cuttings are containerized, tested, and disposed of
  - Grout mix designed to be corrosion resistant
- Repair Geosynthetic Clay Liner
  - Pre-cut liner at each pile cap
  - Place plastic sheeting and backfill
  - Install micropile
  - Patch liner and backfill



CROSS-SECTION A-A

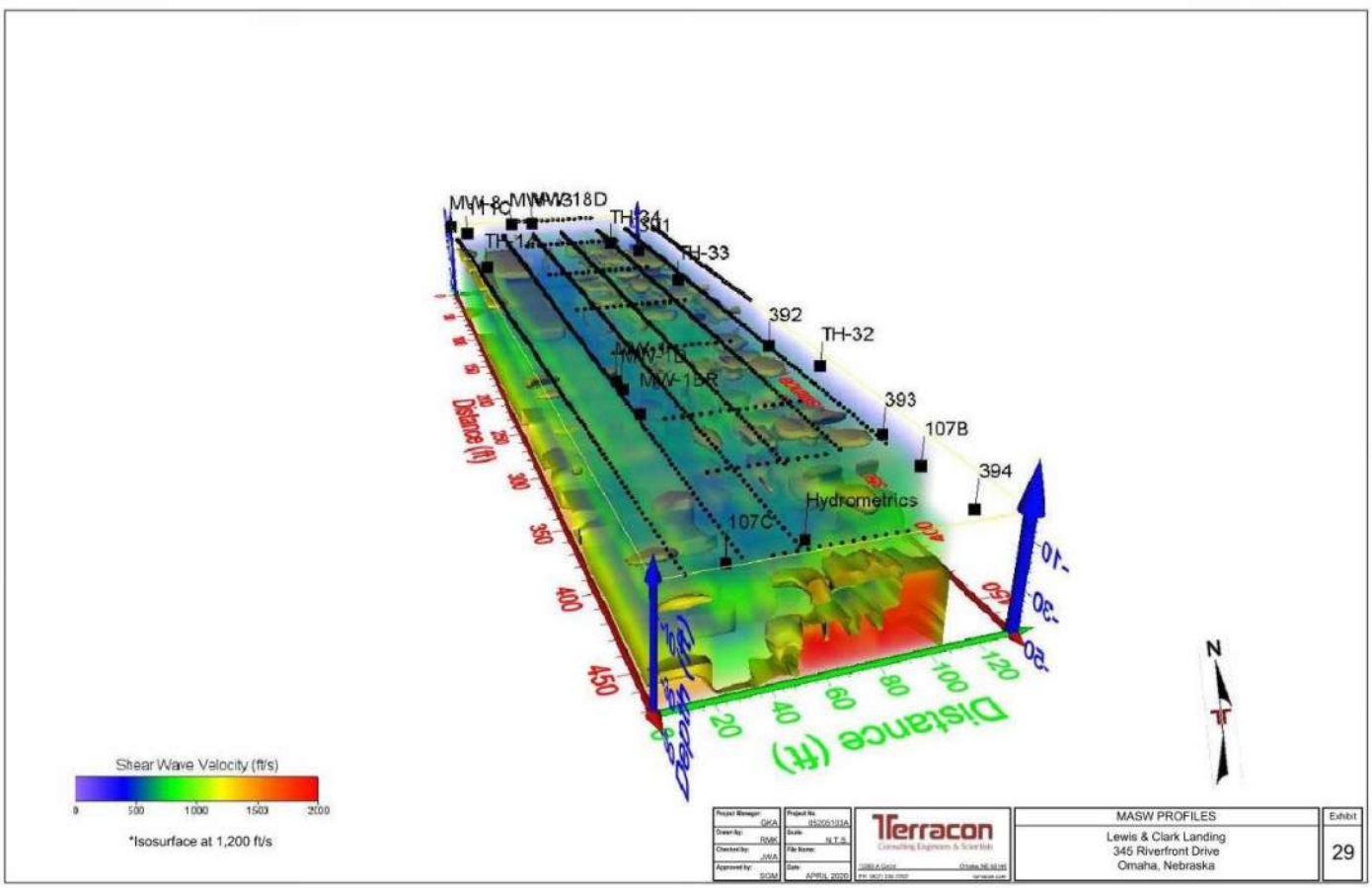
		PROJECT MANAGER	CHRIS J. KOENIG
ISSUE	DATE	DESCRIPTION	
	05.13.2020	GEOTECHNICAL REPORT	
		PROJECT NUMBER	10202117

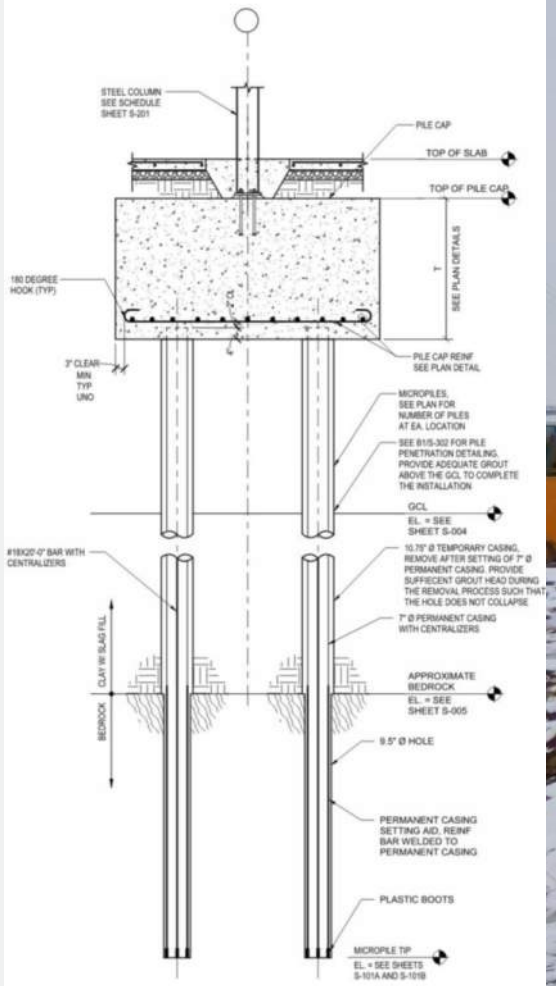
KIEWIT DISCOVERY CENTER
OMAHA, NEBRASKA

LOCATION OF ENVIRONMENTAL MITIGATION FEATURES AND HISTORICAL BUILDINGS

FILENAME: FIG-03.DWG
SCALE: 1"=100'
FIGURE: 3


N
Riverfront Dr
L8H'
L8H
L7G
L5E
L6F
L4D
L2B
L3C
L1A
L1I
L10J'
L10J
L11K'
L7G'
L11K
L12L'
L12L
L13M'
L13M
L14N'
L5E'
L6F'
L14N
L4B'
L15O'
L15O
L3C'
L1A'
L2E'
Riverfront Dr NW
Riverfront Dr SE
Missou
bing
Omaha
Legend
MASW Line Location
DATA SOURCES:
Microsoft Corporation: Bing Maps Hybrid, Bing Maps Road
0 75 150 300 Feet
1:1,033
Project No.: 05185103A
Date: May 2020
Drawn By: RMK
Reviewed By: SGM
Terracon
10080 A Circle Omaha, NE 68144
PH: (402) 330-2202 terracon.com
MASW LINE LOCATIONS
Lewis & Clark Landing
345 Riverfront Drive
Omaha, Nebraska
Exhibit
1


MW-8
MW-18D
TH-1C
TH-34
TH-1A
TH-33
392
TH-32
MW-1B
MW-1BR
393
107B
394
Hydrometrics
107C
Distance (ft)
Distance (ft)
Depth (ft)
Shear Wave Velocity (ft/s)
0 500 1000 1500 2000
*Isosurface at 1,200 ft/s
N
Terracon
MASW PROFILES
Lewis & Clark Landing
345 Riverfront Drive
Omaha, Nebraska
APRIL 2020
Exhibit
29



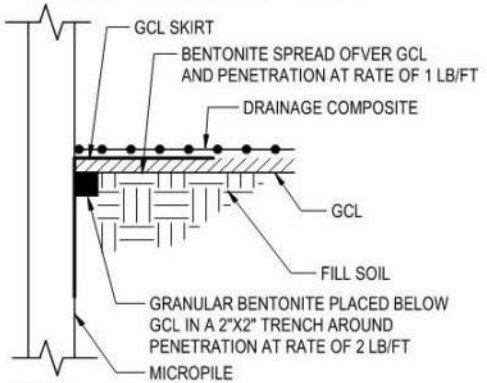
PILE NOTES :

1. MICROPILE CONTRACTOR SHALL OBTAIN AND REVIEW GEOTECHNICAL REPORT AND SHALL BE FAMILIAR WITH ANTICIPATED SOIL STRATA. MICROPILE CONTRACTOR SHALL PROVIDE ADEQUATE EQUIPMENT TO INSTALL MICROPILE TO REQUIRED CAPACITIES.
2. ALL MICROPILE PERMANENT CASING TO BE 7"Ø, 0.498" THICK API N-80 PIPE.
3. ALL PILE INSTALLATIONS SHALL BE OBSERVED AND CAPACITIES VERIFIED BY GEOTECHNICAL ENGINEER.
4. FOR BIDDING PURPOSES TOTAL PILE LENGTH SHALL BE BASED UPON PILE TIP ELEVATION SHOWN. ACTUAL ELEVATION SHALL BE DETERMINED BY GEOTECHNICAL ENGINEER IN FIELD. ANY CONTRACT PRICE ADJUSTMENT DUE TO DIFFERENCES IN TOTAL BASE BID LENGTH FROM TOTAL PRODUCTION LENGTH SHALL BE PER SPECIFICATION.
5. PILES LESS THAN 6 FEET CENTER TO CENTER SHALL NOT BE INSTALLED IN THE SAME WORKING DAY. ALSO ONLY 1 PILE PER PILE CAP PER WORKING DAY IS PERMITTED TO BE INSTALLED.
6. PILE CAPS SHALL BE CENTERED ON COL GRID LINES AND WALL INTERSECTIONS UNO.
7. GCL TO BE RESTORED AND SEALED AGAINST THE MICROPILE INSTALLATION. SEE REMEDIAL ACTION PLAN (RAP) AND SPECIFICATIONS FOR ADDL INFO FOR THE GCL.

A4 TYPICAL MICROPILE AND CAP
NO SCALE

NOTES :

1. NOTIFY OWNER AND ENGINEER A MINIMUM 7 DAYS PRIOR TO PERFORMING ANY EXCAVATIONS NEAR THE EXISTING CAPPING SYSTEM. ENGINEER'S REPRESENTATIVE MUST BE PRESENT DURING ALL EXCAVATION NEAR EXISTING CAPPING SYSTEM.
2. EXCAVATE AS REQUIRED TO REMOVE EXISITING FILL
3. CONTRACTOR TO PROVIDE EXCAVATION AND INSTALLATION WORK PLAN FOR REVIEW BY ENGINEER PRIOR TO STARTING WORK. WORK PLAN SHOULD PROVIDE NARRATIVE TO DESCRIBE ALL ACTIVITES AND PRECAUTIONS TO PROTECT EXISTING CAPPING SYSTEM AND WORK PERSONNEL. WITH EXTREME CAUTION AND IN ACCORDANCE WITH THE MATERIAL HANDLING PLAN (MHP) AND SPECIFICATIONS INCLUDING SECTION 01 74 19.
4. PROTECT EXISTING GCL AND DRAINAGE COMPOSITE.
5. REMOVE DRAINAGE COMPOSITE OVER GCL IN AREA WHERE PENETRATION WILL OCCUR. REMOVE GCL FROM AREA REQUIRED FOR INSTALLATION OF THE MICROPILES.
6. PROTECT EXISTING CLEAN COMPACTED FILL. DO NOT REMOVE SOIL BELOW EXISTING GCL.
7. FOLD BACK AND PROTECT EXISTING GCL. PROVIDE LINER PENETRATION AS SHOWN IN THE TYPICAL LINER PENETRATION DETAIL BELOW. FOLD BACK AND PROTECT EXISTING GCL AT TERMINATION. RE-ESTABLISH TERMINATION WITH NEW CONSTRUCTION.



NOTE :

GCL SKIRT SHALL EXTEND 1 FT VERTICALLY ALONG STRUCTURE AND OVERLAP BASE GCL 1 FT.

TYPICAL LINER PENETRATION AND CAPPING SYSTEM AT PILES

B1

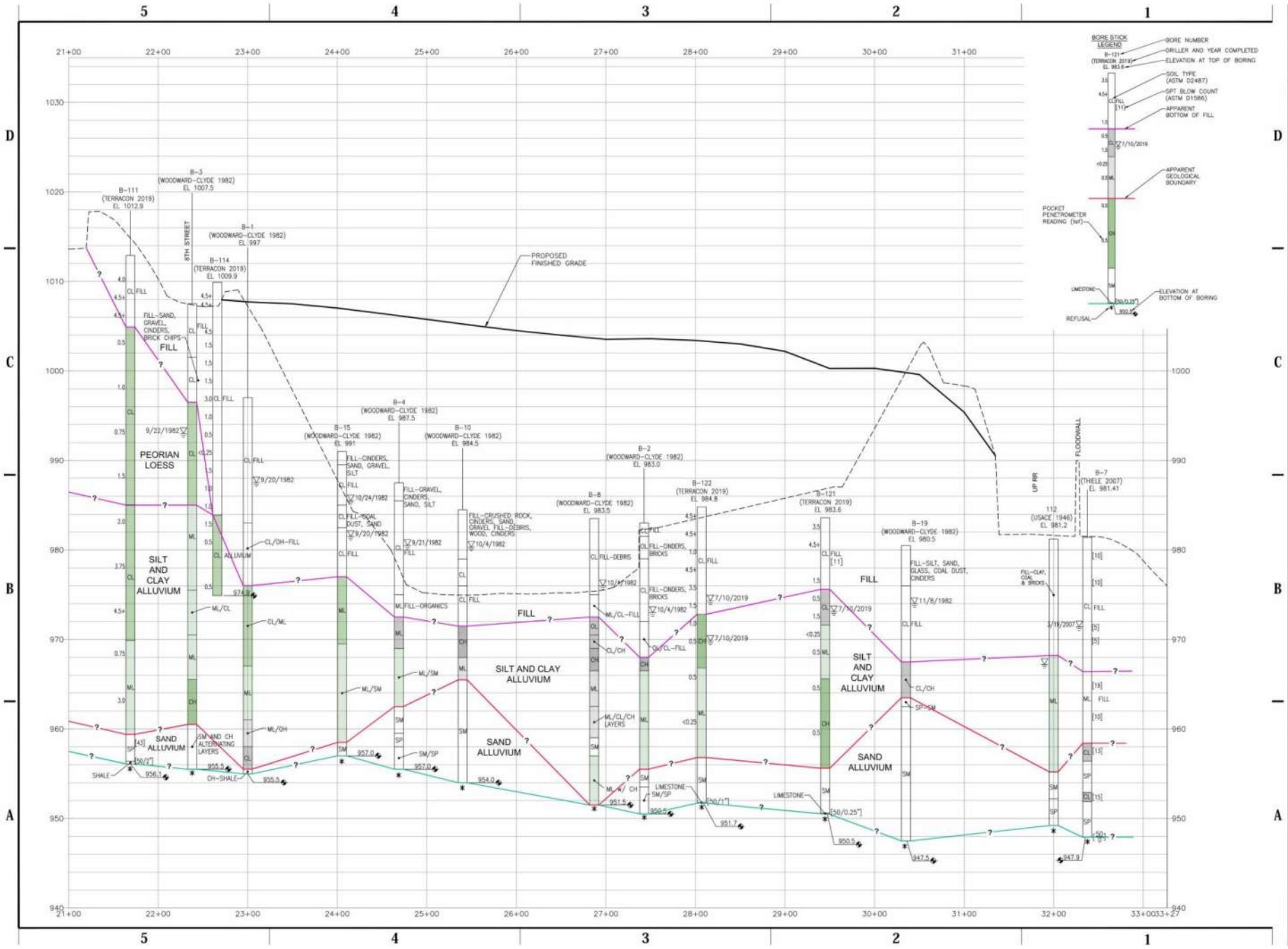
NO SCALE


LUMINARIUM

#3 40-FT Fill adjacent to Retaining Wall, Buried High-Voltage Transmission Line, and Storm Sewer Outfall

Solution:

- Settlement Analyses
- Settle 3D
- Slope Stability Analyses
- SLOPE/w
- 2-Stage Fill Placement
- Deformation Analyses
- SIGMA/w
- Expanded Polystyrene (EPS) Lightweight Fill
- Instrumentation
- Settlement Plates
- Piezometers
- Inclinometers
- Automated Total Station



HEARTLAND OF AMERICA

Client
Metropolitan Entertainment and Convention Authority
455 North 10th Street
Omaha, NE 68102

Landscape Architect + Lead Design
OJB LANDSCAPE ARCHITECTURE
550 Lomas Santa Fe, Ste A
Solana Beach, CA 92075

Site Civil + Prime Consultant
HDR Engineering, Inc.
1917 S. 67th Street
Omaha, NE 68106

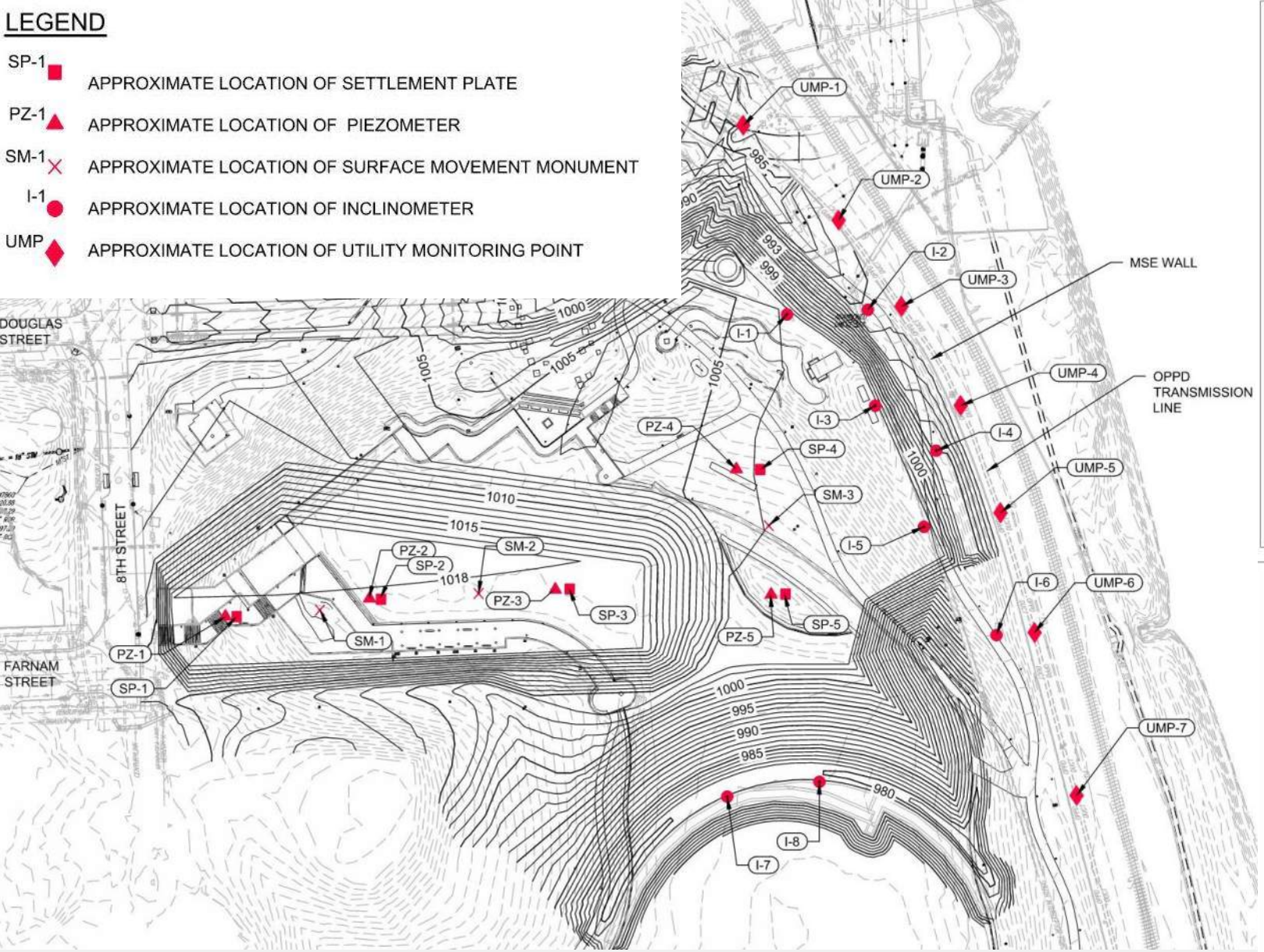
Key Plan

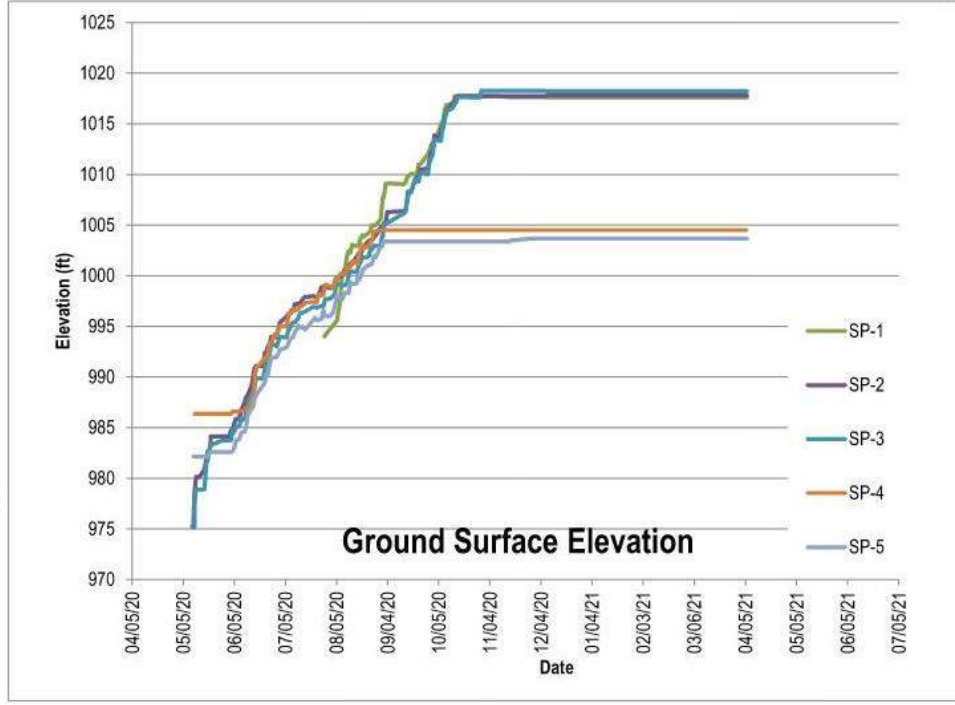
REV	DATE	DESCRIPTION
	03.12.2020	60% DESIGN

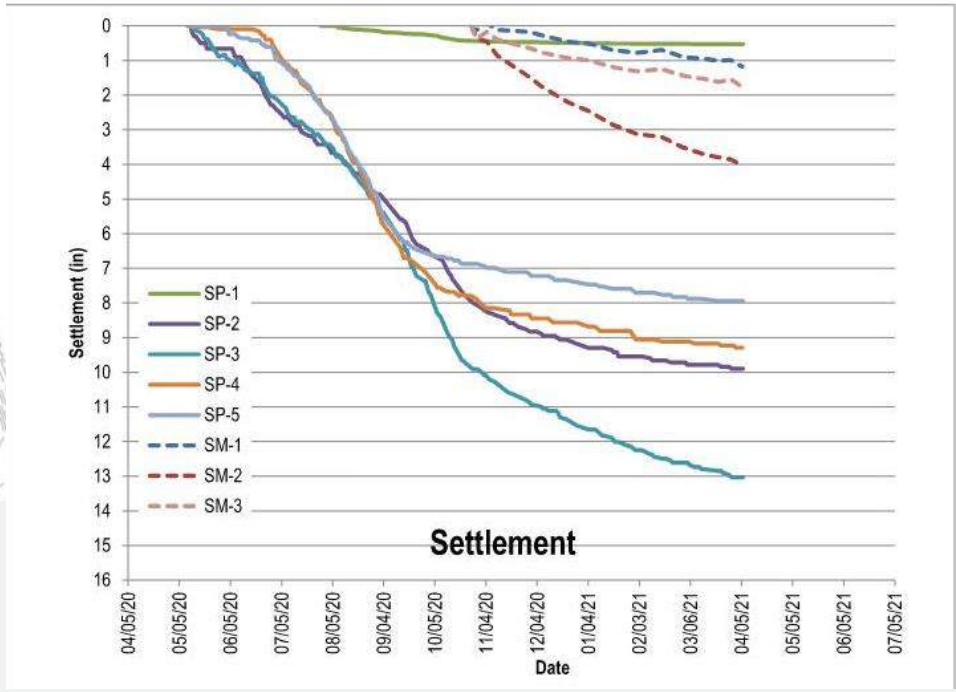
PROJECT NO. OPW 53504

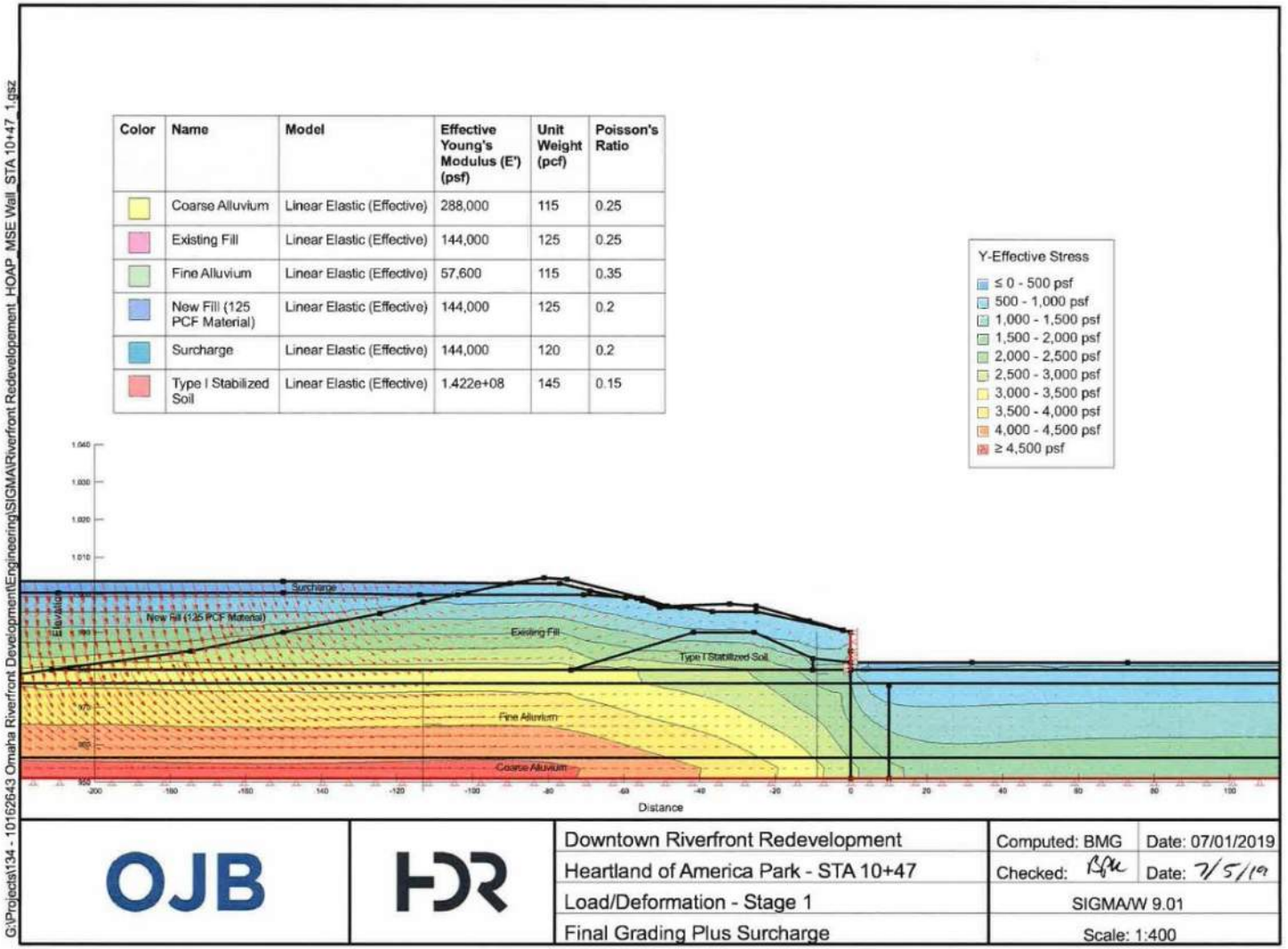
Drawing Title
SUBSURFACE PROFILE

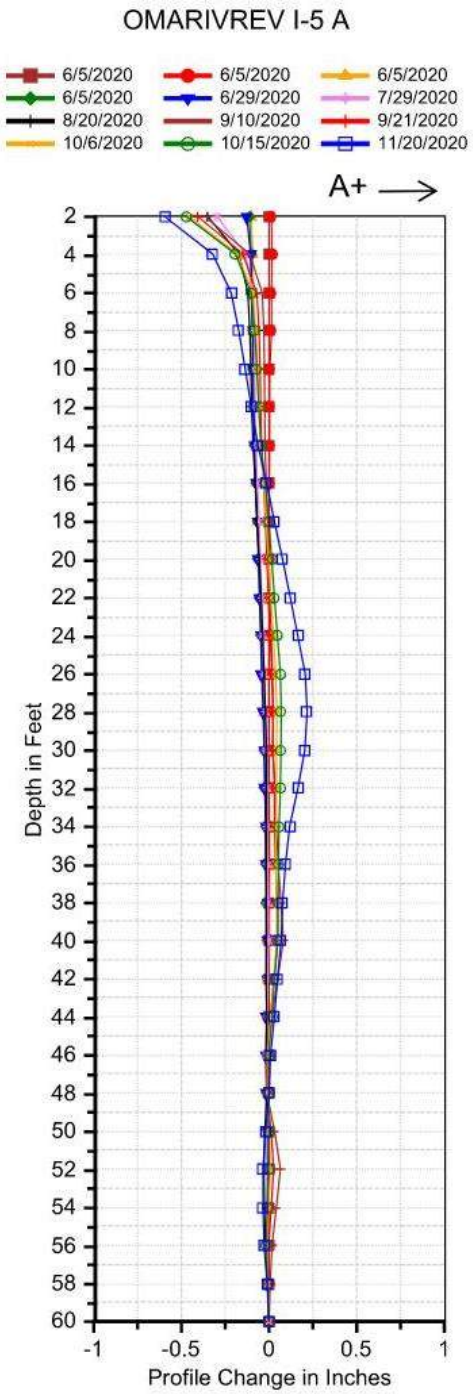
Drawing Number
FIG-07

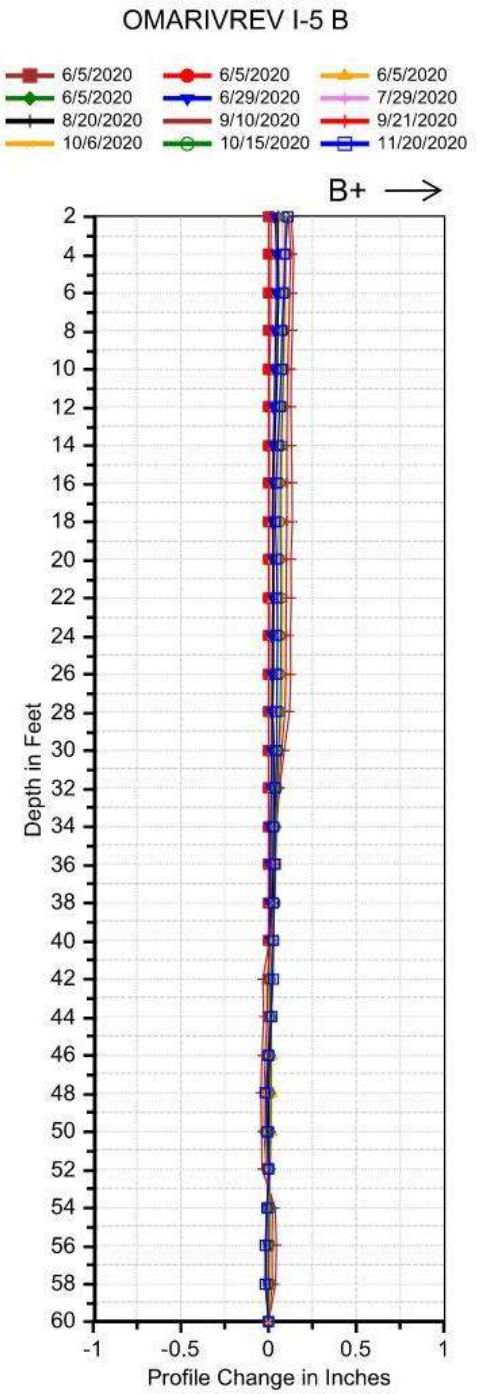

LEGEND
SP-1 APPROXIMATE LOCATION OF SETTLEMENT PLATE
PZ-1 APPROXIMATE LOCATION OF PIEZOMETER
SM-1 APPROXIMATE LOCATION OF SURFACE MOVEMENT MONUMENT
I-1 APPROXIMATE LOCATION OF INCLINOMETER
UMP APPROXIMATE LOCATION OF UTILITY MONITORING POINT
DOUGLAS STREET
8TH STREET
FARNAM STREET
MSE WALL
OPPD TRANSMISSION LINE
UMP-1
UMP-2
UMP-3
UMP-4
UMP-5
UMP-6
UMP-7
I-1
I-2
I-3
I-4
I-5
I-6
I-7
I-8
PZ-1
PZ-2
PZ-3
PZ-4
PZ-5
SP-1
SP-2
SP-3
SP-4
SP-5
SM-1
SM-2
SM-3
1000
1005
1010
1015
1018
995
990
985
980


Ground Surface Elevation
Elevation (ft)
Date
SP-1
SP-2
SP-3
SP-4
SP-5


Settlement
Settlement (in)
Date
SP-1
SP-2
SP-3
SP-4
SP-5
SM-1
SM-2
SM-3


G:\Projects\134 - 10162643 Omaha Riverfront Development\Engineering\SIGMA\Riverfront Redevelopement_HOAP_MSE Wall_STA 10+47_1.gsz
Color | Name | Model | Effective Young's Modulus (E') (psf) | Unit Weight (pcf) | Poisson's Ratio
Coarse Alluvium | Linear Elastic (Effective) | 288,000 | 115 | 0.25
Existing Fill | Linear Elastic (Effective) | 144,000 | 125 | 0.25
Fine Alluvium | Linear Elastic (Effective) | 57,600 | 115 | 0.35
New Fill (125 PCF Material) | Linear Elastic (Effective) | 144,000 | 125 | 0.2
Surcharge | Linear Elastic (Effective) | 144,000 | 120 | 0.2
Type I Stabilized Soil | Linear Elastic (Effective) | 1.422e+08 | 145 | 0.15
Y-Effective Stress
≤ 0 - 500 psf
500 - 1,000 psf
1,000 - 1,500 psf
1,500 - 2,000 psf
2,000 - 2,500 psf
2,500 - 3,000 psf
3,000 - 3,500 psf
3,500 - 4,000 psf
4,000 - 4,500 psf
≥ 4,500 psf
Surcharge
New Fill (125 PCF Material)
Existing Fill
Type I Stabilized Soil
Fine Alluvium
Coarse Alluvium
Distance
OJB
HDR
Downtown Riverfront Redevelopment
Heartland of America Park - STA 10+47
Load/Deformation - Stage 1
Final Grading Plus Surcharge
Computed: BMG
Date: 07/01/2019
Checked:
Date: 7/5/19
SIGMA/W 9.01
Scale: 1:400


OMARIVREV I-5 A
6/5/2020
6/5/2020
6/5/2020
6/5/2020
6/29/2020
7/29/2020
8/20/2020
9/10/2020
9/21/2020
10/6/2020
10/15/2020
11/20/2020
A+
Depth in Feet
Profile Change in Inches


OMARIVREV I-5 B
6/5/2020
6/5/2020
6/5/2020
6/5/2020
6/29/2020
7/29/2020
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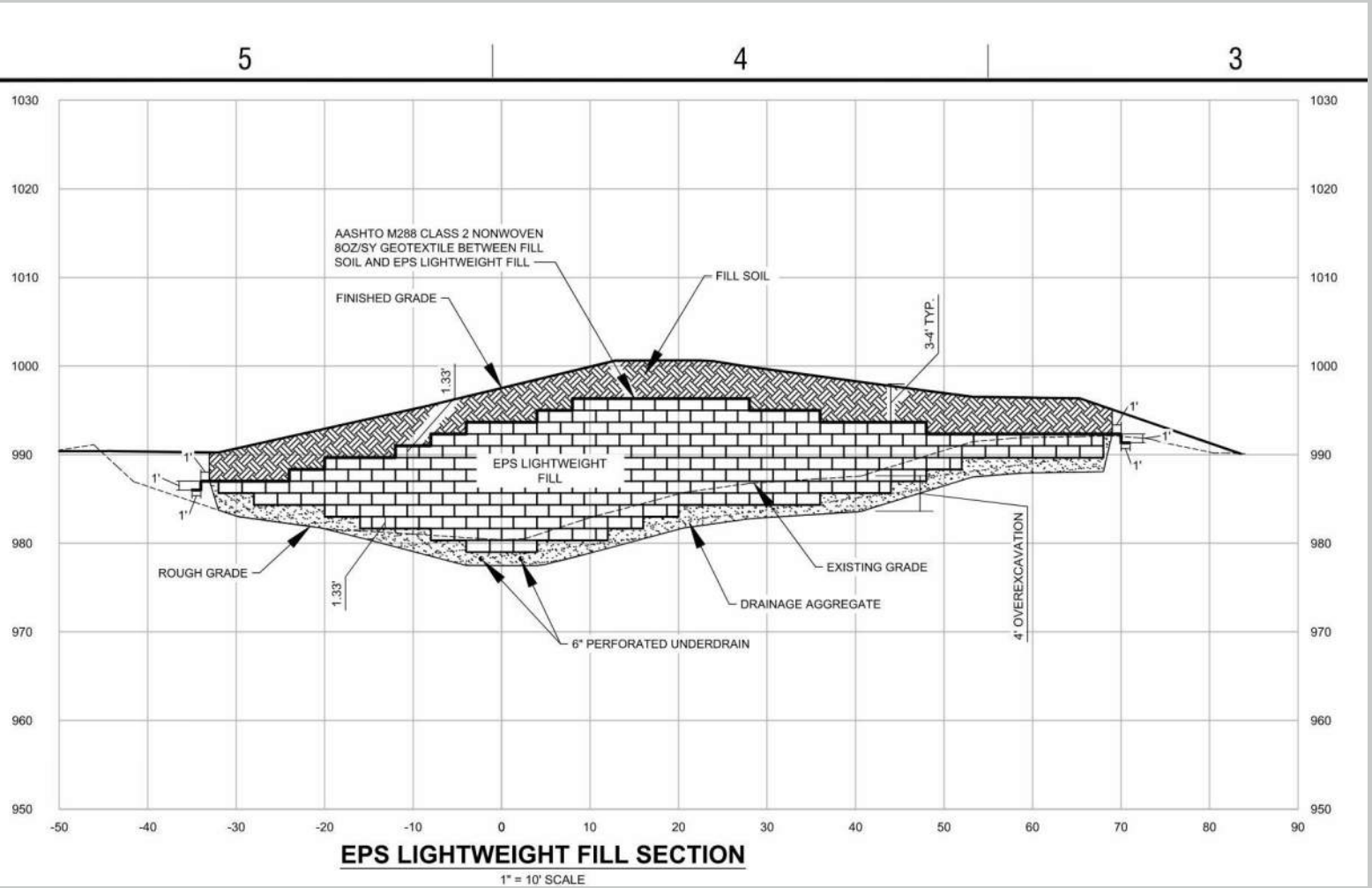
11/20/2020
B+
Depth in Feet
Profile Change in Inches



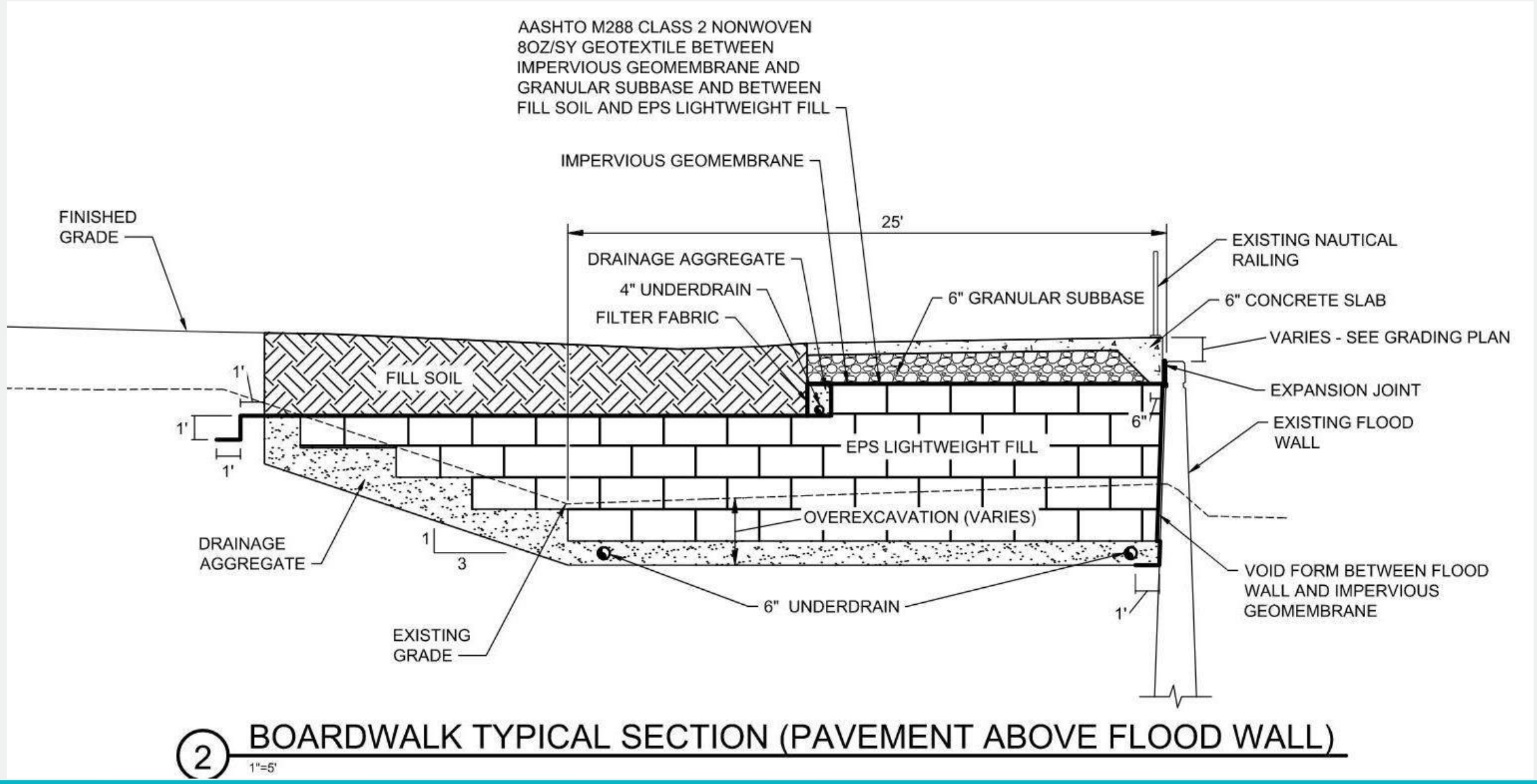
EPS LIGHTWEIGHT FILL SECTION

1" = 10' SCALE

#4 Fill adjacent to Flood Wall

Solution:

- Expanded Polystyrene (EPS) Lightweight Fill




JLG
03.25.2022 07:06

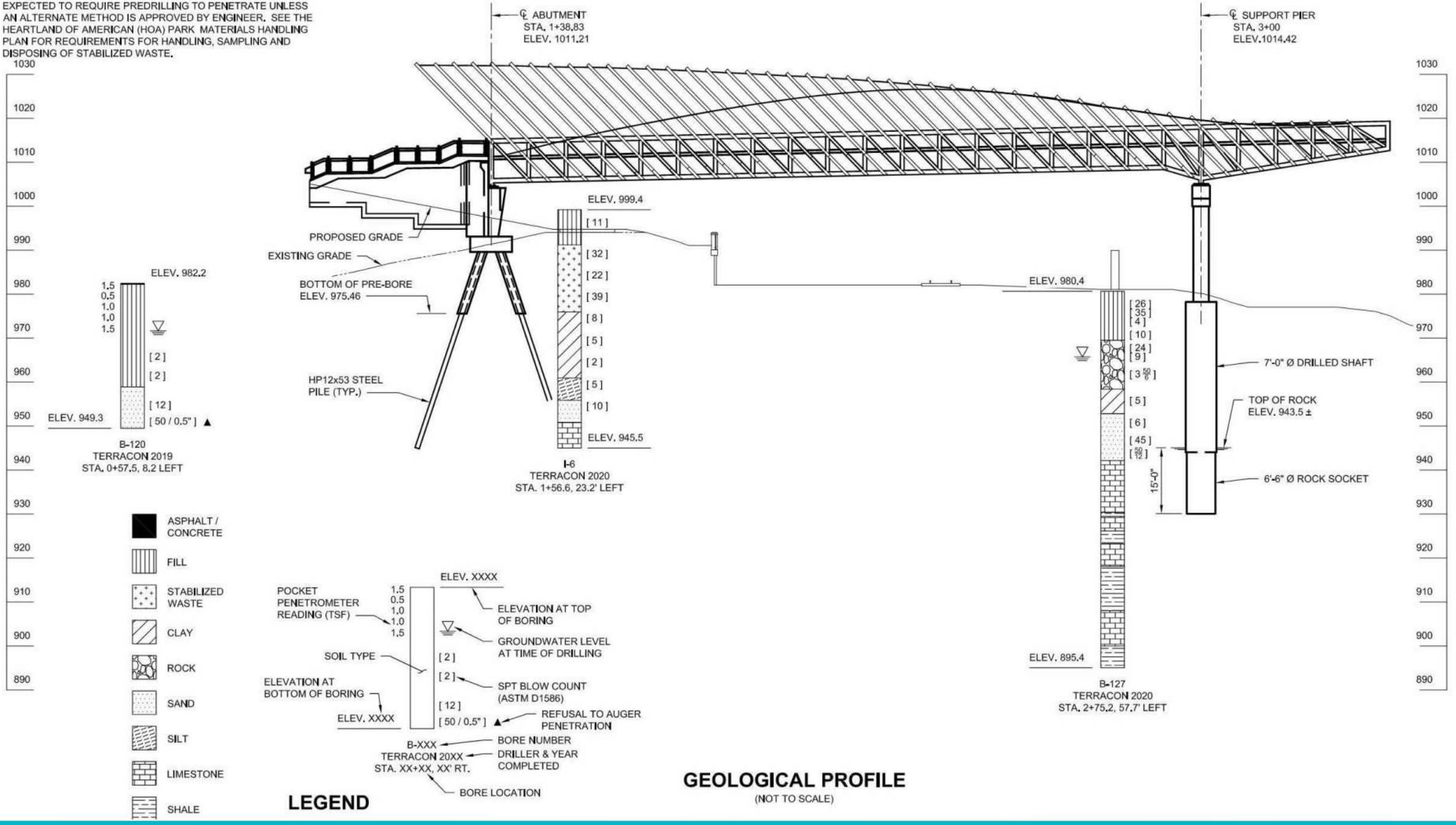
uminarium

#5 Bridge Foundation adjacent to Flood Wall and South Interceptor Force Main

Solution:

- Offset Foundation 15 feet from flood wall and 10 feet from sanitary forcemain
- Drilled shaft
    - Permanent casing to bedrock
    - Oscillator
- Daily surveying of flood wall and sanitary forcemain

ENVIRONMENTAL PROBE NOTE:
THE AREA NEAR THE ABUTMENT HAS BEEN PROBED TO ESTIMATE THE LIMITS OF STABILIZED WASTE. THE STABILIZED WASTE CONSISTS OF CEMENT TREATED SOIL WHICH IS EXPECTED TO REQUIRE PREDRILLING TO PENETRATE UNLESS AN ALTERNATE METHOD IS APPROVED BY ENGINEER. SEE THE HEARTLAND OF AMERICAN (HOA) PARK MATERIALS HANDLING PLAN FOR REQUIREMENTS FOR HANDLING, SAMPLING AND DISPOSING OF STABILIZED WASTE.



LEGEND

GEOLOGICAL PROFILE

(NOT TO SCALE)


BAUER
03.01.2022 13:32


FUCK NAZI Bitches

Geotechnical Leadership was Essential to Project Success

- Protection of Assets
  - Flood Wall
  - Environmental Cap
  - Sensitive Utilities
  - Historic Buildings